
10. Resources

Program Name: Resources.java

Input File: resources.dat

The date is 1965. You've been put in charge of manually managing the resource allocation for the local college's supercomputer. At the start of each day you're given a list of the jobs that must be run that day. You must figure out how much peak memory that day's jobs will use and whether or not the supercomputer has sufficient memory.

Two overlapping jobs cannot reuse the same resources, but two disjoint jobs can use the same resources. This means that if job A uses 7KiB of memory but finishes before job B starts, which requires 6KiB of memory, then the max amount of memory you need is 7KiB.

On the other hand, if job B starts before job A ends, then the max amount of memory you will require is 13KiB (enough for the amount of time that job A and job B overlap).

Input

The first line of input consists of a single integer t , the number of test cases.

Each test case begins with a line consisting of two integers, g and n , where g is the amount of memory available to the machine (given in KB) and n is the integer number of jobs for that day. n lines follow, each line contains three integers, m , s , and d , where m is the memory requirement of the job (given in KB), s is the start time of the job given in minutes since 00:00, and d is the duration of the job in minutes. A job that starts at minute 4 for a duration of 3 minutes and a job that starts at minute 7 are disjoint.

Output

For each test case, if the supercomputer has sufficient memory to execute the schedule, then print SUFFICIENT. If not, print the peak amount of memory that the schedule required in the following form:

OUT OF MEMORY: xKB REQUESTED

where x is the peak memory required.

Constraint

```
1 <= t <= 10
1 <= g <= 20480
1 <= n <= 1000
0 <= m <= 20480
0 <= s < 86400
0 <= s + d <= 86400
```

Example Input File

```
2
32 3
22 10 5
9 13 1
1 12 2
640 4
630 0 60
630 60 60
630 120 60
11 59 2
```

Example Output to Screen

```
SUFFICIENT
OUT OF MEMORY: 641KB REQUESTED
```